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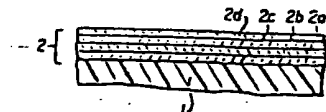
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(54) Plastics cylindrical body.

(57) A plastics cylindrical body with a printed pattern (2) formed on the peripheral surface thereof, said printed pattern being formed by ultraviolet-curable ink layers (2a, 2b, 2c) of at least three colors of yellow, red, and blue placed by printing one over another in the order of the brightness of the colors, with the color of highest brightness being in contact with the peripheral surface, said ink layers being cured individually by irradiation of ultraviolet rays.

FIG. 2



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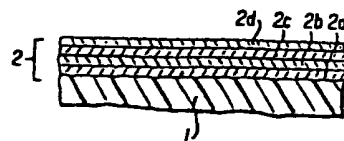
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㉖ **Plastics cylindrical body.**

㉗ A plastics cylindrical body with a printed pattern (2) formed on the peripheral surface thereof, said printed pattern being formed by ultraviolet-curable ink layers (2a, 2b, 2c) of at least three colors of yellow, red, and blue placed by printing one over another in the order of the brightness of the colors, with the color of highest brightness being in contact with the peripheral surface, said ink layers being cured individually by irradiation of ultra-violet rays.

FIG. 2



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Description

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Plastics cylindrical body

15 The present invention relates to a plastics cylindrical body with a printed pattern formed on the peripheral surface thereof, and, more particularly, to a plastics cylindrical body having a pattern formed by the multicolor printing which exhibits a very attractive halftone.

20 Heretofore, the printed pattern on a plastics cylindrical body has been formed by, almost without exception, the complicated "masking process" in the case where the

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1 pattern is a multicolor one. The reason for this is that
if inks of different color are simply printed one over
another, the inks mix together and do not show the desired
tone of color. In addition, printing for a multicolor
5 pattern has to be performed by "masking process" for each
color, and the desired color has to be prepared previously
because the masking process does not permit color mixing.
This makes it necessary to provide inks of a great variety
of colors.

10 As mentioned above, conventional plastics cylindrical
bodies having a multicolor pattern have a disadvantage that
the process for printing the multicolor pattern is compli-
cated, a great variety of inks are required, and yet a sub-
tle halftone cannot be made at the boundary between different
15 colors.

The present invention has been completed in order to
obviate the above-mentioned disadvantage involved in con-
ventional plastics cylindrical bodies having a multicolor
pattern. The invention will be described into detail with
20 reference to the accompanied drawing illustrating an example.

Fig. 1 is a perspective view of an embodiment of the
invention.

Fig. 2 is a partly enlarged sectional view of an embodi-
ment of the invention.

25 Fig. 3 is a schematic view illustrating the most pref-
erable method for producing the cylindrical body according
to the invention.

1 The plastics cylindrical body according to the present
invention is made of a synthetic resin such as polystyrene
resin, polypropylene resin, and polyethylene resin. The
peripheral surface of the thin wall 1 of the plastics
5 cylindrical body is decorated with a pattern 2 which is
formed by printed layers 2a, 2b, 2c, ... of ultraviolet cur-
able inks of at least yellow, red, and blue placed one over
another. The inks of different color are cured individually
by irradiation of ultraviolet rays, and they are placed one
10 over another in the order of the brightness, with the one
having the highest brightness being in contact with the
peripheral surface of the wall 1.

The printed layers 2a, 2b, 2c, ... forming the pattern
2 are placed one over another, and thus it is possible to
15 obtain an attractive halftone by overlapping two or more
colors.

Since the printed layers 2a, 2b, 2c, ... are
cured individually by irradiation of ultraviolet rays, the
ultraviolet curable inks do not mix together prior to curing.
20 This ensures the formation of desired tone of color.

The printed layers 2a, 2b, 2c, ... are placed
one over another in the order of the brightness, with the
one having the highest brightness being in contact with
the peripheral surface of the wall 1. This permits over-
25 printing of black letters on the pattern (2) without the
need of the conventional complicated "masking process".

The process for curing individually the printed layers
2a, 2b, 2c, ... of the pattern (2) will be described
with reference to Fig. 3, in which the cylindrical body

1 is transferred intermittently along the arrows, with stop-
page at stations marked by single circles and double circles.
Printing is performed at the stations I indicated by single
circles, and irradiation is carried out at the stations K
5 marked by double circles. During the transfer along the
line, the cylindrical body is turned in one direction at
a constant speed.

The cylindrical body put on the line undergoes printing
with an ultraviolet curable yellow ink at station I₁, and
10 then moves to the next station K₁ for curing with irradiation
of ultraviolet rays. Thus, the first printed layer 2a of
yellow ink is formed. In the same manner, the second printed
layer 2b of red ink, the third printed layer 2c of blue ink,
and a fourth printed layer 2d of black ink are formed at
15 the subsequent stations, and finally, the pattern 2 is com-
pleted.

The printing immediately followed by curing prevents
inks from mixing together even when inks of different color
are put one over another continuously.

20 As mentioned above, the present invention has advantages
that overprinting without mixing of inks provides a very
attractive halftone and the ink of lowest brightness placed
on the outermost layer provides distinct letters or lines
without the need of "masking process".

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C L A I M S

- 1 1. A plastics cylindrical body with a printed pattern (2) formed on the peripheral surface thereof, said printed pattern being formed by ultraviolet-curable ink layers (2a, 2b, 2c) of at least three colors of yellow, red, and blue placed by printing one over another in the order of the brightness of the colors, with the color of highest brightness being in contact with the peripheral surface, said ink layers being cured individually by irradiation of ultraviolet rays.
- 5
- 10 2. A plastics cylindrical body according claim 1 with black letters overprinted on the pattern (2).

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FIG. 1

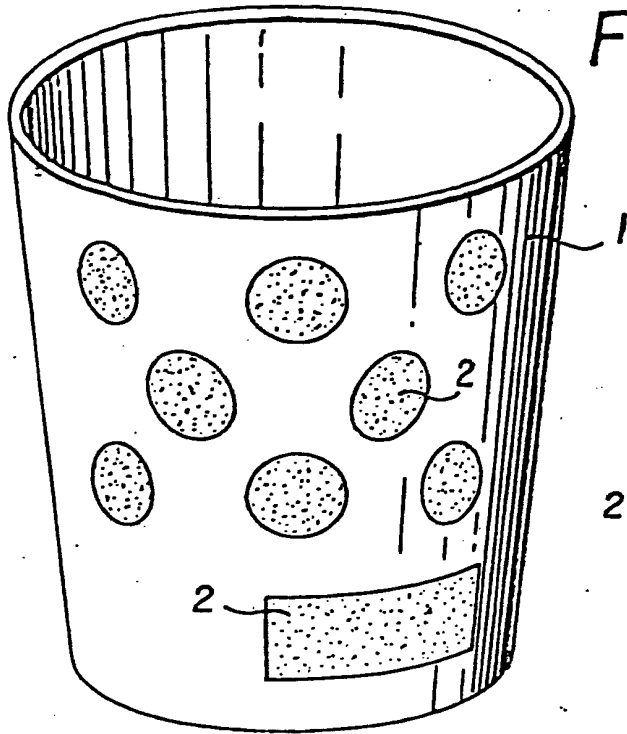


FIG. 2

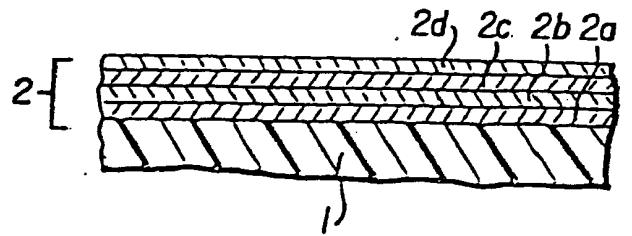
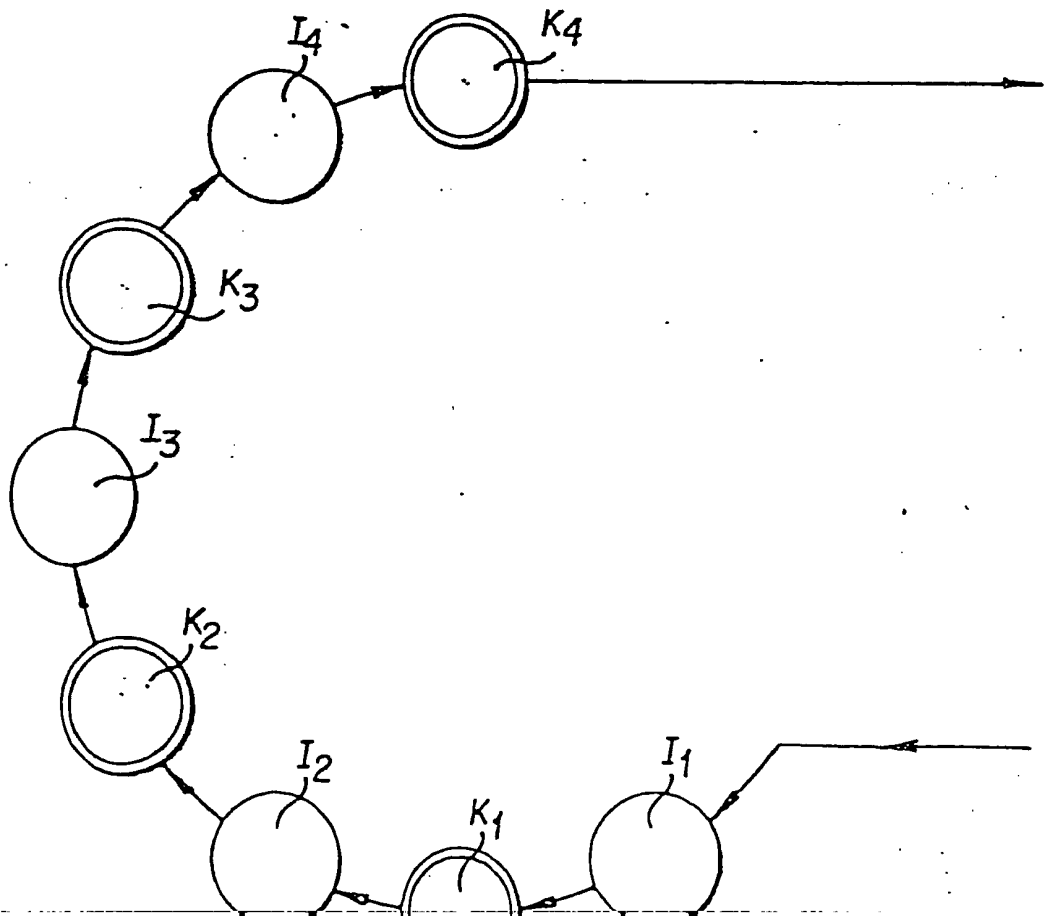


FIG. 3





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 7)
X	<p><u>DFW</u></p> <p>DE-A-2 558 312 (REINHARD MOHN) * Claims 5,7,13; page 13, lines 11-20 *</p>	1,2	<p>B 41 M 1/18</p> <p>B 41 M 7/00</p>
X	<p>---</p> <p>CH-A- 592 526 (BRUHIN AG) * Claims; figures; column 2, lines 6-41 *</p>	1,2	
X	<p>---</p> <p>BE-A- 346 229 (SCHWIMMER) * Claim 3 *</p> <p>-----</p>	1,2	
			<p>TECHNICAL FIELDS SEARCHED (Int. Cl. 7)</p> <p>B 41 M 1/18</p> <p>B 41 M 7/00</p> <p>B 41 M 1/40</p> <p>B 41 M 1/30</p>
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 10-04-1984	Examiner RASSCHAERT A.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>& : member of the same patent family, corresponding document</p>			

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